

WE CLAIM:

1. A dual magnetron power sputtering apparatus comprising:
  - a) a coating chamber containing at least two target materials;
  - b) an ac power supply connected to a transformer to supply an ac voltage to the target materials wherein each of the target materials acts as a cathode and alternately as an anode on each half cycle of the ac voltage;
  - c) a blocking capacitor in series with the output of the transformer and the target materials to prevent the flow of dc current to the target materials;
  - d) a work piece disposed in close proximity of the target materials wherein the presence of a reactive gas sputtered materials from the targets combine with the gas to deposit a thin film on the work piece; and
  - e) a balancing circuit connected across the output of the transformer wherein the balancing circuit allows the power supply to deliver equal power to each target material.
2. A dual magnetron power sputtering apparatus as recited in claim 1 wherein balancing circuit is comprised of a series connected inductor and a variable resistor that shunts dc current and prevents dc voltage from being applied to the dc blocking capacitor.
3. A dual magnetron power sputtering apparatus as recited in claim 2 wherein the balancing circuit causes a deliberate unbalance of power to at least one of the target materials to reduce power to the target thereby compensating for faster erosion of the target.
4. A dual magnetron power sputtering apparatus as recited in claim 2 wherein the variable resistor is implemented as a transistor operated linearly.
5. A dual magnetron power sputtering apparatus as recited in claim 2 wherein the variable resistor is implemented as a boost converter to produce a variable resistive output.
6. A dual magnetron power sputtering apparatus comprising:
  - a) a coating chamber containing at least two target materials;

- b) an ac power supply connected to a transformer to supply an ac voltage to the target materials wherein each of the target materials acts as a cathode and alternately as an anode on each half cycle of the ac voltage;
- c) a work piece disposed in close proximity of the target materials wherein the presence of a reactive gas sputtered materials from the targets combine with the gas to deposit a thin film on the work piece; and
- d) a balancing circuit connected in series with the output of the transformer and the target materials wherein the balancing circuit allows the power supply to deliver equal power to each target material.

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- 7. A dual magnetron power sputtering apparatus as recited in claim 6 wherein balancing circuit is comprised of a parallel RCL circuit placed in series with the output of the transformer.

- 8. A dual magnetron power sputtering apparatus as recited in claim 6 wherein the balancing circuit causes a deliberate unbalance of power to at least one of the target materials to reduce power to the target to compensate for faster erosion of the target.

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